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THE OXYMEL PROCESS IN

Photography

BY PHILIP H. DELAMOTTE F.S.A.

PROFESSOR OF DRAWING IN

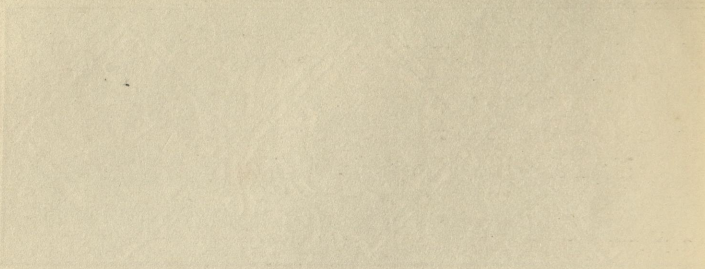
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THE OXYGEN PROPERTIES IN Photography

BY EDWARD J. MANNING, F.R.S.
A TREATISE ON THE THEORY AND PRACTICE OF
THE ART OF PHOTOGRAPHY

LONDON:
JOHN W. PATERSON, 10, ST. MARK'S PLACE, E.C. 4.
1902.

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THE OXYMEL PROCESS IN PHOTOGRAPHY.



THE Oxymel Process, recently announced by Mr. Llewelyn, of Penllergare, is undoubtedly the most valuable discovery in the art of Photography, that has been made since Mr. Scott Archer introduced Collodion.

By the help of Oxymel, all the beautiful delicacy of the finest Collodion pictures may be obtained, with the convenience of the paper process, and with much more certainty, and much greater ease.

Tourists may take a dozen or two plates, ready prepared, and during a week or a fortnight may expose them in the camera as they may require, and in the evening or even in a day or two afterwards may develop the pictures they have obtained at their convenience.

The Oxymel Process

I may as well state at once, to remove any misapprehension, that I have tried this new process myself many times; that I have seen others try it, and that if the necessary precautions are observed, it does not admit of failure.

Mr. Llewelyn went through a course of many hundred experiments before he arrived at a satisfactory conclusion, and I am warranted in saying, that little or no improvement can be made on the exact formula which he has promulgated, and which under his instructions I have myself been working with.

Although great care and great cleanliness are necessary to success in the usual Collodion process, it is indispensable that there be still much more care and much more cleanliness in the use of Oxymel. The least decomposition set up while the plate is in the slide, or the least ray of light falling on the sensitive surface is wholly fatal. If the glass be touched by fingers contaminated with chemicals—if the camera and the slide be not perfectly constructed—if the top of the slide when the shutter is raised be not protected from the light by a cloth—or in fact if any one of the

usual precautions be neglected—then the chances are great that the operator will be completely foiled, and that he will consequently entertain a bad opinion of Oxymel. Let such operator be assured that the fault lies in himself, and not in the process.

Oxymel (οξύς *acid*, μέλι *honey*), for the purpose of Photography should be manufactured of

Acetic Acid . 7 fluid ounces,

Distilled water . 8 fluid ounces,

Honey (despumated) 5 pounds;

Mix the Acid added to the water with the Honey made hot.

It should be filtered till it is quite clear, and free from any cloudiness or sediment. It can be obtained of most Photographic Chemists, but several houses* have undertaken to supply it in its purest possible state, and from the formula above given.

It will be better that I should describe the exact method of procedure from beginning to end, and this will necessarily include the ordinary Collodion process.

* See advertisements at the end.



PREPARATION OF THE CHEMICALS, Etc.

The Nitrate of Silver Bath.

(30 grains to 1 oz. of water.)



To make a Bath sufficient for a plate of glass ten inches by eight, about forty ounces will be needed.

Take

Nitrate of Silver	$2\frac{1}{2}$ oz.	} dissolve
Distilled water	5 oz.	

Take

Iodide of Potassium	8 gr.	} dissolve
Distilled water	$\frac{1}{2}$ oz.	

Pour the Iodide into the Nitrate solution, and shake it until the precipitate (iodide of

silver) thus formed is entirely redissolved. Then add 34 oz. of distilled water. Let it stand all night, and then add 2 drachms of the best alcohol. Filter it with prepared filtering-paper, and the bath is then ready for use. This solution, if kept quite clean, will remain in good order for years. Whenever it is not perfectly clear, it must be again filtered.

The Collodion.

I HAVE not yet found any superior to that made by Mr. R. Thomas. It is almost indispensable that it should be iodised (according to the prescribed form) at least two days before it is wanted for use. For landscapes it is better when a week old, and for copying engravings when it has been iodised for at least a month. I would recommend those who are constantly practising photography to begin by buying two pints, and as soon as the first pint is exhausted, to purchase another, so as always to have a supply in stock that is not newly made. Uniodised collodion, like port wine, is all the better for keeping, and by adopting

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my recommendation, a photographer may save himself much vexation.*

The Oxymel.

WHEN wanted for use dilute it in this proportion :—

Oxymel	1 oz.
Distilled water	4 oz.

Filter it through fine blotting paper until the syrup becomes perfectly clear.

The Developing Solution.

I cannot find any better proportions than

Pyrogallic Acid	5 grains	}	mix and filter
Glacial Acetic Acid	1 drachm		
Distilled water	2 oz.		

When wanted for use mix in a 4 oz. glass measure one-third of this solution with two-thirds of filtered water, keeping the stronger

* My usual plan is to iodise about 6 oz. of Collodion at a time—I shake it well and then stand it aside for two or three days, and for use pour about three or four ounces into a smaller wide mouthed bottle without disturbing any sediment. There are obvious advantages in this plan.

solution in a large bottle for occasional use when some parts of the picture, towards the close of the developing, require more energetic treatment.

The Fixing Solution.

I STILL adhere to a saturated solution of hyposulphite of soda; but I find many of my friends use cyanide of potassium (a most deadly poison) in the following proportions:—

Cyanide of Potassium	10 grains
Filtered water	1 oz.



THE GLASS PLATES.

IT is best to prepare a number of glass plates at once, but it must be borne in mind that ordinary cleansing will not suffice. Take half a dozen (or a dozen) glasses of good quality, and with a piece of sand-stone,—with notch cut in it to the depth of the eighth of an inch,—rough the surface of the glass on each side to the smallest possible extent all round the edges. This is to cause the colodion to adhere more securely to the plate, so that in the repeated washings it may not be torn.

Make a solution of

Ammoniaë Liquor	$\frac{1}{2}$ oz.	} mix
Tripoli .	$\frac{1}{2}$ drachm	
Clean water .	3 oz.	

and with a linen rag rub it hard over all the plates and set them aside. Then taking each glass in succession dip it into a large basin or tray of water, and with a clean linen rag rub off all the tripoli and set the plate up to drain. Repeat this a second time with the cleanest water and the cleanest linen rag; and as each glass is dipped, with a proper supply of clean linen cloth,* rub it quite dry and place it in the plate box, at the bottom of which it is advisable to lay two or three folds of blotting paper.

There are many substitutes for the ammonia and tripoli such as pearl-ash, a weak solution of cyanide of potassium, any of which will answer the purpose if the plates be well rubbed with the detergent, and then well rinsed in pure water as I have described.

* These cloths must not be washed with soap.

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OXYMEL PROCESS.

Preparation of the Glass Plate.



SI have before said, it is best to prepare half a dozen or more plates at a time, as they will keep when coated with oxymel, for a week or fortnight without any deterioration. It is of the utmost importance that the room in which the following operations are performed should be perfectly clean and free from any dust. The following preparations will be needed:—

Nitrate of Silver bath.

Iodified Collodion, at least two days old.

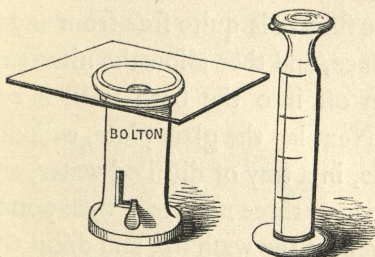
Oxymel (diluted) in a gutta percha tray
a little larger than the glass plate.

Distilled water, an abundance of.

A second gutta percha or porcelain tray.

Blotting paper.

Lay a cleaned glass-plate down on a flat surface covered with a clean cloth, and with a pneumatic holder, such as is now sold by



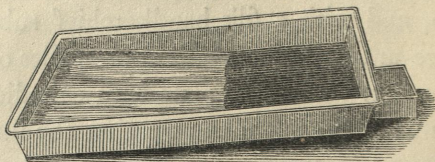
most dealers* in photographic materials, take it up, and with a silk handkerchief rub the surface until a light breath upon it flies off in a moment. Coat the plate with collodion in the usual way, but take care that the surface is covered in every part; if a corner be left, water may get under the collodion and cause serious inconvenience. As soon as the collodion film is set, plunge the plate into the Nitrate bath; and from this time take the greatest care that no ray of light enters the dark room. If the sun should shine upon the window, it is necessary to shade it with at

* See advertisements at the end.

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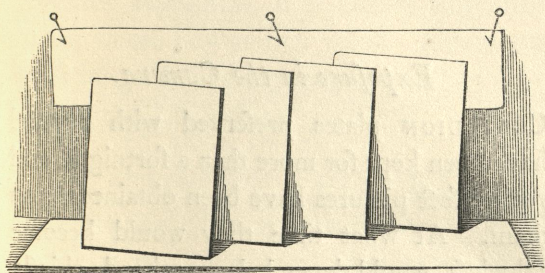
least five or six thicknesses of yellow calico ; otherwise three are sufficient.

When the collodion plate has remained two minutes in the Nitrate bath, raise it and lower it till the surface is quite free from any streaky appearance, and then allow the nitrate of silver to drain off into the bath until it ceases to drip. Next lay the glass plate, collodion-side upwards, in a tray of distilled water, and let it be for two or three minutes ; then pour off the water, repeat the washing, and drain the plate pretty closely. Tilt the tray containing the



oxymel with a wedge, lay the plate with its back upon the tray, and at the same moment withdraw the wedge. This will cause the oxymel to flow over the surface in one even wave, and this is of importance, as any unevenness would tend to spoil the picture. Let the plate lie in the oxymel for two minutes ; then tilt the tray again, and with great care lift

the plate, and allow as much of the fluid to run off as is convenient ; then set up the plate on a piece of blotting paper to drain ; and when the next glass is ready, remove it to a shelf lined with blotting paper, where it may remain till all are prepared.



When all the plates have been thus treated, and the last has had sufficient time to drain, place them in a plate box,* lined with blotting paper at the bottom, and keep them where it is utterly impossible for light to get to them.†

* Mr. Ottewill has invented a very convenient dark box, which will contain as many plates as are required ; and which fits into the back of the Camera in such a way that several pictures may be taken without the necessity of having any dark chamber.—See advertisement at end.

† Turn the plate box in such a way that the plates lie on their backs, and take care the film is not torn in putting them in or taking them out.

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If all free nitrate of silver is washed off the plates before they are immersed in the oxymel it will keep for a considerable time, and may be used over and over again. Should the oxymel become much discoloured, it would be better to procure a fresh supply.

Exposure in the Camera.

COLLODION plates preserved with oxymel have been kept for more than a fortnight, and yet perfect pictures have been obtained upon them. At what time they would become valueless, would depend, I apprehend, chiefly on the state of the weather.

When wanted for use, great care must be taken that those parts of the camera-slide, which the glass plates touch, are well varnished; and even then it would add to the security of the plate if small pieces of blotting paper were fixed in the corners of the frame in such a way that the glasses cannot touch the wood in any part.

The time of exposure for an oxymel-plate may be said to be five times that required for the usual collodion process. Dark objects,

such as trees in the foreground, will want as much as ten minutes' exposure with a Ross's Landscape Lens, three inches in diameter with a diaphragm of $\frac{1}{4}$ of an inch. A house in sunshine or a distant landscape will of course require much less time: but as all Photographers well know, it is utterly impossible to lay down any certain rules. Every one must be guided by experience.

Development of the Image.

THE Oxymel plate may be developed at leisure. It will keep good after exposure for several days. Take great care that no white light enters your dark room, and that it is not dusty.

Be careful not to break the edge of the collodion film as you take out the plate. Lay it on the levelling stand and cover it well with clean water, which may be immediately poured off. Take the usual strength of developing solution, add a few drops of Nitrate of Silver from the Bath,* and mix it well; pour this evenly over the surface, and continue the de-

* It is better to keep a small bottle ready for this use.

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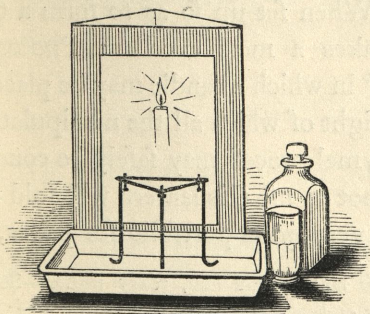
velopment for some time longer than is usual with the ordinary process. The image ought to appear as vigorous and intense as in a wet collodion picture taken under the same circumstances.

Fixing the Image.

WHEN the image is brought out enough, wash the plate freely with water, and fix it either with a saturated solution of Hyposulphite of soda, or Cyanide of Potassium mixed in the proportion of 10 grains to an ounce of water. When the Iodide of Silver is all dissolved, wash the plate for some two or three minutes with an abundance of water, and set it up to drain upon a piece of blotting paper.

Varnishing the Plate.

WHEN the film is perfectly dry, with a moist cloth remove the edge of the film where the glass has been ground, for about one-eighth of an inch all round and varnish in the usual way. I prefer the French varnish sold by Gaudin and Co.



PHOTOGRAPHY BY CANDLE- LIGHT.



Many Amateurs in Photography have but little spare time during the day in which they can practise the various processes, I think the following suggestion may be found useful:—

Take three millboards, about twelve inches high by nine inches wide, and cut out a large piece, say eight inches by five inches from the centre of each. Lay all three boards close together side by side, and having pasted or glued them well, cover them entirely with

The Oxymel Process

two thicknesses of yellow calico. Ornament them in any way you please on the other side. When set up so as to form a triangle this makes a most excellent Photographic lantern* in which a candle may be placed, and by the light of which all the manipulations of the Oxymel process may safely be conducted. When not in use this lantern will fold up and make a very good portfolio for paper, &c.

* These lanterns are fold, ready made.—See advertisement at end.



THE PRINTING PROCESS.



AS one of the Committee appointed by the Photographic Society to enquire into the best method of printing and preserving Photographs, I have lately devoted much attention to the subject. With the able assistance of Mr. Hardwich, the Committee have been enabled to determine satisfactorily, that, by the use of proper precautions, photographic prints may be rendered quite as permanent as water-colour drawings or copper-plate engravings. Even these will become faded and discoloured if they are subjected to damp or the bright glare of the sun,—and so doubtless will the best printed photographs,—but no one ever allows a valued drawing to be served thus, and a photograph requires to be treated with the same care as a drawing.

The Printing Process

I adhere to three methods of printing, two of which I have long practised, and which always give me satisfactory results, when I take pains. I say this, for I really find that the same watchful care is necessary in the printing of even one good impression, as is wanted in the production of a first-class negative.

On Albumenized Paper.

No better paper than Canson's has yet been supplied to photographers. I more frequently use the thin sort, termed the "Negative;" it has a finer surface, gives brighter pictures, and is less expensive, but it is more easily torn.

To albumenize this paper, I find it usually more convenient to cut it in half.

Into a clean white basin with a lip, put	
Chloride of Sodium	200 grains
Distilled Water	10 oz.

} dissolve

and add

Whites of fresh Eggs 10.

Beat this well up into a froth with a bunch of quills or a wooden fork, then filter it through a piece of fine muslin to get rid of

the scum, and let it stand for a few hours, protected from dust, until it becomes perfectly clear. When wanted for use, re-filter as much as is required and pour it into a flat porcelain dish, a little larger than the paper. Look carefully through all the sheets of paper you are about to albumenize, and with a pencil mark the smooth side (all papers have one side smoother than the other). Take the paper sheet by sheet, fold back about a quarter of an inch of one corner, and float the smooth side upon the albumen, placing one end of the paper on first and gradually depressing it until it all lies upon the albumen, and taking great care to avoid air bubbles;—let it lie for a minute or two, until it becomes perfectly flat, then raise it quickly by the turned-up corner; let the albumen drain off, and then hang the paper up by two corners in some warm room to dry. When all the sheets are albumenized, and all are perfectly dried, place them evenly and carefully between two boards, lay a weight upon them, and there let them be until they are wanted for use. It is not necessary to apply a heated iron, as some photographers recommend.

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I excite this paper by floating it, in the usual way, upon a bath consisting of

Nitrate of Silver	60 grains	} dissolve.
Distilled Water	1 oz.	

This must be done in a yellow light. Let the paper (cut to the required size) remain about two minutes upon the bath, then drain it and hang it up to dry by means of a wooden clip holding it at one corner. If you are printing extensively, I would advise that trays be placed under the paper to catch the Nitrate of Silver that drips from them. I have found this a great saving, especially when I have been sensitizing large sheets of paper. When the solution of Nitrate of Silver has become discoloured, it may be filtered through powdered pipe-clay and restored to its original clearness.

When dry, the paper is now ready for exposure to light:—clean the glass of the pressure frame well upon both sides, and if you are not provided with a pad of smooth felt, which I find the best thing, fold a few sheets of blotting paper to nearly the size of the pressure frame glass. Take out the back-board, lay the negative, face upwards, upon the glass; place the paper, albumenized side,

upon it, cover these with the felt, and then replace the back-board, and screw it evenly till it is quite tight. It is now ready to be exposed to the light, either in the sun or in the shade, according to circumstances. The pressure frame should have a hinged back-board, which allows you to look at one half of the picture without disturbing the other half; when the edges of the paper, which usually project beyond the negative, have become darkened, examine the picture to see if it be sufficiently printed; if not, let it remain till it assumes a rather deeper tone than that you would like. An under-exposed, or any weak or thin-looking negative will print best in the shade; but it is difficult to give any precise rule in this matter, it is better to try both ways.

When the picture is sufficiently printed, remove it carefully from the frame—for if you pull it off violently, you will often spoil the negative—and place it in a colouring bath made in the following way:—

Hypo-sulphite of Soda	8 oz.	} dissolve
Clean Water	8 oz.	
Chloride of Gold	8 grains	} dissolve
Clean Water	6 oz.	

The Printing Process

Nitrate of Silver	60 grains	} dissolve
Clean Water	2 oz.	

Pour the solution of chloride of gold into the hypsulphite, stirring with a glass rod all the time, then add the nitrate of silver.

Let the picture lie in this bath, but move it about constantly, to avoid stains and air-bubbles, until it assumes the colour you like, then place it for about ten minutes in a fixing bath of

Hypsulphite of Soda	3 oz.
Clean Water	16 oz.

and then if you are fortunate enough to be able, lay it in a dish through which a stream of clear water can run for six or eight hours. If this cannot be managed, lay each print separately as it comes from the fixing bath in a tray of clean water for five minutes, then place it in a large and deep tray full of water, to which other prints may be added. At the end of an hour, pour off the water to the last drop and refill the tray. Repeat this six or eight times during the next twenty-four hours, taking care that the prints are constantly moved about, and that they do not

stick to each other, and then, probably, all the hyposulphite will have been washed out ; but if you want to render your pictures perfectly permanent, I would advise you to treat them as I did those which were reported upon by Mr. Hardwich* to the Committee of the Photographic Society. I have for a long time been impressed with a belief that so long as any of the size remains in the paper, photographs will be liable to fade. Some three years ago I tried the effect of pouring boiling water† upon prints that had previously been well washed, and in not one single instance have I known a photograph so treated to change colour afterwards in the least degree. It is true that the boiling water sometimes takes off the brightness of the picture ; but if the picture has been well toned, this may be restored by ironing it while it is yet damp. A little practice, with careful jotting down of notes, will soon enable any photographer to adopt this certain method of rendering his pictures pleasing and permanent.

* See Photographic Journal, No. 42.

† The prints should not be left in the boiling water more than six or eight minutes.

The Printing Process

By the Sel d'Or Process.

It is rather singular, and not easily accounted for, that negatives which yield but indifferent impressions upon albumenized paper, will *sometimes* give quite good pictures by the Sel d'Or process; and, on the other hand, those which are unpleasing by the Sel d'Or, will come out vigorous and fine by the use of Albumen. I have more than once astonished friends by printing their discarded negatives in such a way as to make them doubt if I had not changed the glass negative.

The Sel d'Or process is peculiarly adapted to portraits and some kinds of landscapes, but not to all. It requires much more careful watching than the Albumen paper; but if you have a good negative to work with, it amply repays the trouble.

The best paper for this process is the Papier Saxe, or German Positive. It must first be salted. Take

Chloride of Ammonium	100 gr.	} dissolve
Clean Water	8 oz.	
Purified Gelatine	16 gr.	} dissolve
Warm Water	2 oz.	

Mix these solutions, and float the paper (smooth side) only so long as is required to cause it to lie quite flat; then hang it up to dry. Any quantity of paper thus prepared will keep good for any length of time.

Excite this paper on a 60-grain solution of Nitrate of Silver in the same way as the Albumen paper (see page 24), and expose it to light in the pressure frame, but do not overprint the picture one shade deeper than that you wish for.

When the picture has been sufficiently printed, put it in a dish and let a stream of water run over it for a few minutes; this is to remove the excess of Nitrate of Silver; then place it in a bath of

Liquor Ammoniaë	1 dram,
Clean Water .	1 pint,

and let it remain there till it assumes a slight red tint (probably in about a minute). Wash the picture again in clear water till it ceases to seem of a milky hue, and then remove it to the colouring bath made as follows:—

Chloride of Gold .	4 grains	} dissolve
Clean Water .	8 oz.	

The Printing Process

Hyposulphite of Soda	12 grains	}	dissolve
Clean Water	8 oz.		

Pour the solution of gold into the Hypo-sulphite.

Watch the picture carefully while in this bath, and in about ten or fifteen minutes it will assume a proper colour; if it be left in the bath too long the whites will turn yellow.

Wash the picture again for a minute, and then immerse it in a bath of simple Hypo-sulphite—4 oz. to a pint of water, for about ten minutes. Then wash it in the usual way, and if you wish it to be quite permanent, pour boiling water upon it, as I have before recommended.

All the operations of this process are best conducted in a room shaded from bright light.

By the Ammonio-Nitrate Process.

THIS process is perhaps not so easy as those which I have just described; but for some kinds of portraits, copies of engravings, &c. it has its advantages. The best paper to use is the Papier Saxe.

To salt the paper, take

Chloride of Sodium 20 grains.

Clear Water . . 1 pint.

Place this in a flat dish and immerse the paper, turn it over, and then hang it up to dry.

To make Ammonio-Nitrate of Silver, take

Nitrate of Silver	120 grains	} dissolve
Distilled Water	2 oz.	

Add, drop by drop, good liquor Ammoniaë, stirring the solution continually with a glass rod until the precipitate which is formed is entirely redissolved. Do not add more Ammonia than is just sufficient to clear the solution. When it is bright, add three or four drops from your Nitrate of Silver bath, and then filter. Ammonio-Nitrate thus prepared, if kept from the light, will remain good for any time.

To sensitize the paper. Lay the sheet of salted paper upon a board rather larger than itself covered with blotting; incline the board gently, and with a large camels-hair brush (fold for this purpose), cover the paper with the solution of Ammonio-Nitrate, beginning along the top and working downwards. Re-

The Printing Process.

peat this across the paper, and take care that it is evenly wetted all over. Let it lie for a minute and then hang it up by a wooden clip, in a darkened place, to dry.

In printing, expose the paper thus prepared until it assumes a dark slate-blue. Fix and colour it in the same way as Albumenized paper, and pay great attention to the washing.

To Mount Photographs.

I FIND nothing better than a solution of good Gelatine or Gum Arabic, such as is usually sold at the Druggists. It must be mixed nearly of the consistency of honey, and laid on to the back of the Photograph as evenly and lightly as possible, and then applied to the mounting-paper or cardboard directly, and rubbed down well with a piece of blotting-paper over it. It should then be placed under a weight and allowed to remain some hours.

If the Gum be thin, it will perhaps run through the paper, and tend to curl the mounting-paper or board.